



# **COBie Certified Professional™ Learning Objective Summary**

**Version 1.1**

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## INTRODUCTION

The [COBie Educational Curriculum](#) identifies four levels of COBie learning and skills required for enterprise-wide COBie implementation[1]. buildingSMART provides opportunities for certification at two of these four levels: “*Foundation*” and “*Practitioner*.” Associated learning objectives have been objectively defined against [Bloom’s Taxonomy](#)[2].

**To successfully complete the COBie Certified Professional™ examination, candidates demonstrate their knowledge and skill at both the *Foundation* and *Practitioner* levels.**

This document reproduces *Foundation* and *Practitioner* learning objectives defined in the COBie Educational Curriculum. This document also illustrates how the five required levels of knowledge and skill might be translated into possible examination questions.

**COBie Certified Professional™ examination candidates may use this outline to assist in exam preparation.**

## LEARNING OBJECTIVE SUMMARY - FOUNDATION

The required COBie *Foundation* knowledge and skills listed below are defined at Bloom’s levels: Knowledge and Comprehension.

- F-1 Describe the basis for COBie requirements.
  - F-1.1 Locate the document containing the COBie standard.
  - F-1.2 Identify the current version number of the COBie standard.
  - F-1.3 Locate the underlying ISO standard upon which COBie is based.
  - F-1.4 Describe the file formats allowed for COBie information delivery.
  - F-1.5 Describe the parties who contribute to the delivery of COBie data.
  - F-1.6 Explain COBie data elements contributed by each party.
  
- F-2 Describe why COBie is needed.
  - F-2.1 Describe Facility Owner benefit(s).
  - F-2.2 Describe Facility Manager benefit(s).
  - F-2.3 Describe Contractors benefits(s).
  - F-2.4 Describe Subcontractors benefit(s).
  - F-2.5 Describe Designer and Consultant benefit(s).
  
- F-3 Explain what is included in COBie.
  - F-3.1 Explain project types for which COBie deliverable is relevant.
  - F-3.2 Identify facility elements that may not be included in COBie.
  - F-3.3 Identify facility elements that may be included in COBie.
  - F-3.4 Explain the method used to adapt the list of elements.
  - F-3.5 Explain the role of classification with a COBie data set.
  - F-3.6 Locate the default classification contained within the COBie standard.

- F-4 Explain how COBie is organized.
  - F-4.1 Describe the two hierarchies behind the COBie structure.
  - F-4.2 Describe the data sets needed for each hierarchy.
  - F-4.3 Describe the data sets used in common.
  - F-4.4 Explain each element in all commonly used COBie data sets.
  - F-4.5 Explain the allowable data types in a COBie spreadsheet.
  - F-4.6 Describe the terminology needed to define a unique COBie object.
  - F-4.7 Describe the terminology needed to define relations between COBie objects.
  
- F-5 Explain the COBie process.
  - F-5.1 Describe how owners may modify allowed COBie objects.
  - F-5.2 Describe how owners may specify COBie object properties.
  - F-5.3 Describe how owners may specify COBie object classification.
  - F-5.4 Describe how owners may specify COBie relations.
  - F-5.5 Identify COBie data elements provided during design.
  - F-5.6 Identify COBie data elements provided during construction.
  - F-5.7 Explain the minimum content in COBie deliverables.
  - F-5.8 Explain the artifacts included in a complete COBie deliverable.

## LEARNING OBJECTIVE SUMMARY - PRACTITIONER

The required COBie *Practitioner* knowledge and skills listed below are defined at Bloom's levels: Application, Analysis, and Evaluation.

- P-1 Assess the application of the COBie data structure in context.
  - P-1.1 Define all COBie data structure elements found in COBie standard, Annex A.
  - P-1.2 Apply COBie data structure to organize provided project data.
  - P-1.3 Estimate COBie data based on provided project descriptions.
  - P-1.4 Evaluate COBie data based on project phase requirements.
  - P-1.5 Evaluate COBie data based on standard quality control rules.
  
- P-2 Analyze COBie regional customizations.
  - P-2.1 Identify allowed COBie customizations.
  - P-2.2 Identify requirements for customizing classifications.
  - P-2.3 Evaluate the quality of proposed classification customizations.
  - P-2.4 Evaluate proposed customizations to the COBie exclusion lists.
  - P-2.5 Verify COBie property set customizations.
  - P-2.6 Validate COBie property set customizations.
  
- P-3 Assess COBie best-practices during design.
  - P-3.1 Describe the conditions required to export BIM-based COBie data.
  - P-3.2 Adapt BIM-use for export of Architectural COBie data.
  - P-3.3 Adapt BIM-use for export of MEP COBie data.



- P-3.4 Conduct Quality Control of COBie data exports.
- P-3.5 Exchange and merge COBie data.
- P-3.6 Package a design-stage COBie deliverable.
  
- P-4 Assess COBie best-practices during construction.
  - P-4.1 Evaluate COBie construction data's applicability to design BIM.
  - P-4.2 Evaluate construction administration processes for COBie data.
  - P-4.3 Describe the process used to exchange and merge COBie data.
  - P-4.4 Package a construction-stage COBie deliverable.
  
- P-5 Assess COBie Quality Management practices.
  - P.5.1 Justify the need for objective testing of BIM-based deliverables.
  - P.5.2 Justify the COBie standard Quality Management process.
  - P.5.3 Justify the requirement for automated COBie data testing.
  - P.5.4 Evaluate COBie design data for compliance with standard.
  - P.5.5 Evaluate COBie construction data for compliance with standard.
  - P.5.6 Evaluate COBie design data for applicability to project.
  - P.5.7 Explain why objective testing of BIM data is necessary.
  
- P-6 Describe the relationship between COBie and IFC.
  - P-6.1 Identify all COBie reference standards.
  - P-6.2 Describe COBie in the context of the current set of IFC MVD's
  - P-6.3 Identify the IFC standard section pertaining to allowable file formats.
  - P-6.4 List the file formats in which COBie data may be provided.
  - P-6.5 Identify inefficient methods for delivering COBie data.

## EXAMPLE QUESTIONS

To help familiarize candidates with the types of questions they may encounter during the COBie Certified Professional™ examination, five sample questions are provided below.

These questions illustrate how questions may be created to assess candidates at each of the five Bloom's levels included in the COBie Certified Professional™ exam.

For those who have not read the COBie Educational Curriculum document, it should be noted that unless stated otherwise, all questions pertain to the spreadsheet presentation of the COBie standard.

Multiple choice questions require the candidate to select the best answer(s). Incorrect options for multiple choice questions are called "detractors" because they include selections reflecting commonly held incorrect knowledge.

**Knowledge/Remembering:** *define, list, recognize*

*question type - manually type in a short answer*

What is the Primary Key for the COBie.Type Tab?

Type.Name (*correct*)

**Comprehension/Understanding:** *describe, explain, identify, locate, recognize, sort*

*question type - select all correct answers*

Which COBie.Type fields are **NOT** required by standard at construction?

- (a) Manufacturer
- (b) ModelNumber
- (c) WarrantyGuarantorParts
- (d) WarrantyDescription
- (e) ReplacementCost (*correct*)
- (f) ExpectedLife (*correct*)
- (g) ModelReference (*correct*)
- (h) Weight (*correct*)

**Application/Applying:** *choose, demonstrate, implement, perform*

*question type - select one correct answer*

How are COBie equipment assets located outside a building?

- (a) COBie.Component rows are identified by COBie.Space (*correct*)
- (b) COBie.Type rows can be located outside the building
- (c) COBie.Component rows' attributes identify their location as outside the Facility
- (d) COBie.Component rows reference the COBie.Facility row

**Analysis/Analyzing:** *analyze, categorize, compare, differentiate*

*question type - select one correct answer*

The installed equipment model numbers often differ from the approved number. In these cases, installed model numbers are best captured where?

- (a) Attribute.Value (*correct*)
- (b) Type.ModelReference
- (c) Type.ModelNumber
- (d) Type.CodePerformance
- (e) Not Allowed

**Evaluation/Evaluating:** assess, critique, evaluate, rank, rate

question type - select one correct answer

In the figure below, scan the row inside the highlighted box to find the column containing an error. (CTRL + to zoom in, CTRL - to zoom out)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Name	CreatedBy	CreatedOn	Category	Description	AssetType	Manufacturer	ModelNumber	WarrantyDurationParts	WarrantyDurationParts	WarrantyDurationLabor	WarrantyDurationLabor	WarrantyDurationUnit	WarrantyDurationUnit
1														
2	AC Unit Type 1	bill.east@	2011-09-1	23-75 10 2	Horiz. D.X.	Fixed	sales@mit	n/a	sales@mit	1	sales@mit	1	year	n/a
3	AC Unit Type 2	bill.east@	2011-09-1	23-75 10 2	Horiz. D.X.	n/a	sales@dat	DAPA-2.5	sales@dat	1	sales@dat	0	year	n/a
4	AC Unit Type 2	bill.east@	2011-09-1	23-75 10 2	Horiz. D.X.	Fixed	sales@dat	DAPA-2.5	sales@dat	1	sales@dat	0	year	n/a
5	AHU	bill.east@	2011-09-1	23-75 35 1	n/a	Fixed	sales@Yor	AP-500	sales@Yor	1	sales@Yor	1	year	Autoc
6	Air Compressor - D	bill.east@	2013-01-2	23-65 55 1	Duplex Pat	Fixed	manufactu	DAC-M55	manufactu	n/a	manufactu	0	manufactu	n/a
7	Air Cooled Chiller	bill.east@	2011-09-1	23-75 10 2	633-703 k	Fixed	sales@Yor	YCAS0150	sales@Yor	1	sales@Yor	1	year	Autoc
8	Air Cooled Condens	bill.east@	2011-09-1	23-75 10 2	3500 Watt	Fixed	sales@dat	DRCU-031	sales@dat	1	sales@dat	0	year	n/a
9	Air Cooled Condens	bill.east@	2011-09-1	23-75 10 2	2500 Watt	Fixed	sales@mit	PUG248KB	sales@mit	1	sales@mit	1	year	n/a
10	Air Separator	bill.east@	2011-09-1	23-75 50 1	Centrifuga	Fixed	info@amt	6-AS	info@amt	1	info@amt	1	year	n/a
11	Backflow Preventer	bill.east@	2011-09-1	23-65 55 1	20 mm	Fixed	sales@ap	RP40	sales@ap	5	sales@ap	0	year	Autoc
12	Ball Valve 100 mm	bill.east@	2011-09-1	23-65 55 1	100 mm	Fixed	sales@ap	64-10A	sales@ap	2	sales@ap	2	year	n/a
13	Ball Valve 150 mm	bill.east@	2011-09-1	23-65 55 1	150 mm	Fixed	sales@ap	SS-P76	sales@ap	2	sales@ap	2	year	Autoc
14	Ball Valve 50 mm	bill.east@	2011-09-1	23-65 55 1	50 mm	Fixed	sales@ap	64-108	sales@ap	2	sales@ap	0	year	Autoc
15	Ball Valve 65 mm	bill.east@	2011-09-1	23-65 55 1	65 mm	Fixed	sales@ap	64-109	sales@ap	2	sales@ap	0	year	Autoc
16	Ball Valve 80 mm	bill.east@	2011-09-1	23-65 55 1	80 mm	Fixed	sales@ap	64-100	sales@ap	2	sales@ap	0	year	Autoc

- (a) Name (*correct*)
- (b) Category
- (c) Description
- (d) AssetType
- (e) No Error

**REFERENCES**

[1] East, E. William (2020) "COBie Educational Curriculum," COBie Certification Subcommittee, buildingSMART international [https://cobie.buildingsmart.org/wp-content/uploads/2020/04/COBie-Educational-Curriculum\\_V1.0.pdf](https://cobie.buildingsmart.org/wp-content/uploads/2020/04/COBie-Educational-Curriculum_V1.0.pdf) (cited 20-Apr-20).

[2] University Library (2020) "Tips on Writing Learning Outcomes," University of Illinois, <https://www.library.illinois.edu/staff/infolit/learningoutcomes/> (cited 20-Apr-20).